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INDEX-LINKED FINANCIAL ASSETS AND THE BRAZILIAN
"INFLATION-FEEDBACK" MECHANISM

Paul Peckerman, Visiting Lecturer, Department of
Economics

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College of Commerce and Business Administration
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Summary:

After briefly reviewing Brazil's experiment with financial index-linking, this essay describes how the availability of index-linked financial assets can serve to propagate inflation forward through time in a macro-economic system. Evidence is provided from the recent Brazilian inflationary experience to show how the "inflation-feedback" process has operated in that country through the availability of index-linked assets.

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Introduction.

After nearly a decade of declining rates of price increase, the Brazilian economy suffered an inflationary relapse following the 1973 oil crisis. Unlike the relatively brief "oil inflations" of many other nations, Brazil's inflation has persisted, and remains a serious problem at this writing. Brazil's inflation problems have been compounded by severe disarray in the nation's short-term financial markets. Now it is clear that the Brazilian inflation is much more than an "oil" inflation. Analysts of the Brazilian economy have vigorously debated the causes of the persisting inflation and the financial turbulence, without reaching broad agreement. There is a widespread suspicion, however, that one of the important causes of Brazil's macro-economic stabilization problems is the availability of index-linked financial assets. The purpose of the present essay is to examine this possibility.

Before turning to discuss the Brazilian "inflation-feedback" process, and the role that financial index-linking might play in this process, we briefly review Brazil's experiment with financial index-linking.¹ Index-linked financial assets have been available in Brazil since 1964, when a military government assumed power. The new government inherited a large budget deficit of some years' standing, as well as the consequent inflation (which reached an annual rate of 100 per cent in early 1964). On the advice of its civilian economics ministers, the new government introduced index-linked government bonds as a means of financing the deficit with a minimum of money creation. Their reasoning was that Brazilian financial investors would obviously not purchase nominal government obligations while the future rate of inflation remained high and unpredictable.²

Since the government felt that it could not bring the budget under control immediately, and since the government preferred to control the inflation gradually in order to avoid widespread bankruptcies and severe depression, it seemed inevitable that the inflation would persist at high rates for several years. The index-linked bonds were thus intended as a temporary means of mitigating the inflationary effect of the government deficit while the inflation persisted. In the event, the rate of inflation fell even more gradually than the government had hoped, and financial index-linking ceased to be a stop-gap expedient and became an institutionalized means of "living with inflation."

Since their introduction the government bonds have been readjusted according to the Brazilian wholesale price index lagged by several months. The precise formula for the readjustment has been altered several times (see the explanatory note to Table 3). At least until 1975 and 1976, when fundamental changes were made in the readjustment formula, the government bonds have probably been as close to perfect inflation hedges as was technically feasible in Brazil. This is shown in Tables 2 and 3, which present the nominal and deflated values of the government-bond principals since 1964. After 1964 the bonds were clearly successful as a means of financing the government deficit. (See Tables 4 and 5).³

The government extended the index-linking principle to other areas of the economy, particularly to the important national Housing Finance System, which was set up between 1964 and 1966 in an attempt to resolve Brazil's desperate housing shortage.⁴ The private and public agencies of the Housing Finance System capture savings through index-linked "housing bonds" and passbook savings accounts. The principal social-security fund

of the future rate of inflation, the "pre-fixed" index-linking procedure has functioned essentially as a means of controlling nominal rates.⁶ Given the persistent if declining inflation of the 1964-1973 period, it is difficult to deny that financial index-linking permitted Brazil certain important economic achievements. The government deficit, which persisted until 1973, was largely financed in a non-inflationary form. The housing sector accumulated a massive volume of savings, which has come to be applied not only to housing but to municipal infrastructure, and has generated considerable employment in the construction industry. Financial investors and household savers have had inflation-resistant assets in which to hold their wealth, and there is no question that the forced-savings schemes would have been inconceivable without their being protected against the erosion of their real value.

Nevertheless, the Brazilian public has never been very happy about the experiment with index-linking. For one thing, understandably enough, Brazilians have never liked to take on inflation-proofed debt, and this has been the major reason why private financial institutions outside the Housing Finance System have been unable to use index-linking. Even the Housing Finance System was forced to compromise the index-linking principle for mortgages: mortgages are now re-adjusted through a complicated scheme under which the monthly payments of amortization and interest calculated when the mortgage is signed are adjusted annually according to the government's annual wage guidelines.⁷ (The Brazilian government has generally maintained a tight wage policy since 1965.) Brazilian consumers are persuaded that any index-linked debt would mushroom unreasonably, if not turn perpetual; Brazilian businessmen fear that the prices of their own products

is applied in index-linked accounts to the National Housing Bank, which is the central financial and coordinating agency of the Housing Finance System. The National Housing System came to account for virtually all of Brazil's index-linked savings stock by the late 1960s. Since then the government has also established several other index-linked "forced-savings" funds. Certain state-owned enterprises (notably the national electrical-infrastructure company, Eletrobrás) have issued index-linked debentures; and several state and municipal governments have issued index-linked obligations.

Despite the efforts of the government to encourage them, however, private corporations and financial institutions have proven reluctant to issue index-linked obligations. The reasons for this reluctance are disputed by economists. The view of this writer is that such enterprises have been unwilling to take on index-linked obligations backed by current assets that cannot, by their nature, be proof against inflation with certainty.⁵ For private commercial banks, finance companies, investment banks, and the government's development banks (which remain to this day the only domestic source of long-term industrial finance), the government has allowed the use of what it calls "pre-fixed" index-linking, through which the securities and loans of such institutions carry a government estimate of the percentage increase in the price level over the term of the contract, in addition to the legal maximum interest rate of 12 per cent per year. (The usury law limiting interest to 12 per cent per year remains in force, although it is now defined for legal purposes as net of inflation.) The government has generally tried to control nominal interest rates. Consequently, since the government had discretionary power to set the estimate

through several channels. The introduction of financial index-linking effectively opens some channels and suppresses others. Therefore we cannot be absolutely certain that the Brazilian inflation-feedback mechanism would be less robust if index-linking had never been introduced.

Section I presents our theoretical discussion, and Section II presents our examination of the Brazilian data.

I. Channels of the "inflation-feedback" process.

The macro-economic "inflation-feedback" process which we describe here operates essentially through the formation of inflationary expectations and uncertainty. As a broad generalization, an increase in the rate of price increase typically leads to increases in inflationary expectations and uncertainty;¹⁰ these increases set off the feedback process. For brevity, allow us to refer henceforth to an increase in the rate of inflation that causes increases in the expected rate of inflation and in the uncertainty attaching to this expectation as "an inflationary deterioration." Let us briefly review the reasons why an inflationary deterioration will be likely to have inflationary effects on the rates of saving and investment and on the demand for and supply of money; then we ask whether the introduction of financial index-linking would be likely to diminish or augment these inflationary effects.

Suppose first that no index-linked assets are available in the economy. An inflationary deterioration would probably decrease the rate of savings, which would be inflationary, for the following reasons: first, because consumers would prefer to purchase durable goods sooner rather than later when their prices (might) rise; second, because the expected real interest rate on savings is reduced; and third, because

would fail to maintain pace with the price index. Thus, while Brazilians are pleased to be able to hold index-linked assets, they remain quite unwilling to hold index-linked debt.

The most widespread misgiving about index-linking among Brazilians has been the conviction that it somehow strengthens the "inflation-feedback" mechanism. The general argument is that current inflation is caused only in part by current demand-pull and cost-push factors: it is caused also by the inflation that occurred in the recent past. The earlier inflation, it is argued, "feeds back" through the formation of expectations and the force of previous commitments to generate inflationary pressure in the current period. Now such a feedback mechanism undoubtedly exists in any economy. Brazilians, however, have come to believe, as a virtual truism, that index-linking has made their feedback mechanism particularly robust. Some of the most enthusiastic Brazilian proponents of index-linking have admitted that they accept this view.⁸ Nevertheless, there has been little theoretical analysis to substantiate the view that financial index-linking strengthens the feedback mechanism. There is even some empirical evidence in a recent paper by Cláudio Contador that seems to suggest that index-linking has had no such effect in Brazil,⁹ although we will argue below that Contador's results must be interpreted carefully.

In this essay, we will argue that the availability of index-linked assets can serve to propagate inflation forward through time, and moreover, we will argue that the data on the Brazilian experience between 1972 and 1976 are quite consistent with our theoretical analysis. We will also argue, however, that the inflation-feedback process operates

the uncertainty attaching to this real rate is increased. (These effects on the savings rate will be offset, if the initial real interest rate is high on a backward-bending savings-supply curve, and to the extent that the public responds to an increase in inflationary uncertainty by saving more rather than less, in an attempt to maintain the real savings stock for precautionary purposes.)

An inflationary deterioration would probably increase the rate of investment, which would also be inflationary. This would happen, first, because of the decrease in the expected real rate of interest, which entails both a reduction in the expected real cost of borrowed funds and an increase in the valuation of equity, and hence a reduction in the cost of capital perceived by firms; and second, because of the increased uncertainty attaching to the expected real rates of return on money, which would probably generate an increase in the valuation of equity. (These effects on the investment rate will be offset to the extent that the increased inflationary uncertainty turns the prospective cash flow on possible investment projects more unpredictable.)

Next, an inflationary deterioration would surely decrease the demand for money, which would be inflationary. This is because the expected real rates of return on assets competing with money--with the exception of nominal bonds and nominal savings instruments--will now be higher relative to the expected real rate of return on money. In addition, the uncertainty attaching to the expected real rate of return on money will be increased, and in general this should also serve to decrease the demand for money.¹¹

Finally, an inflationary deterioration is quite likely to force an increase in the money supply, through its effects on the composition of

the banking system's assets and liabilities. This happens in the following way. One likely consequence of an inflationary deterioration will be an attempt by the public to run its demand deposits as low as possible, and to move its wealth out of money and into inflation-resistant assets—capital goods, real estate, jewelry, foreign exchange, and so on. At the same time, however, there will probably be a sharp increase in the demand for bank credit, first, because as part of the inflationary process the real prices paid and received by firms will be altered considerably; and second, because the inflation was not anticipated when contracts currently in force were originally signed. Both of these effects tend to generate situations in which firms are compelled to ask for credit. Hence the immediate consequence of an inflationary deterioration is quite likely to be, ironically, a liquidity crisis in the commercial-banking system. Now this places the monetary authority in a dilemma: Should it attempt to confront the inflation or the liquidity crisis? Obviously, the authority will feel political pressure on both sides. At first the authority may try to confront the inflation by tightening credit, or by at least allowing the liquidity crisis to "run its course." But this is likely to provoke some bankruptcies, and perhaps a recession. This will alarm the authority, and probably force its hand politically. It will then permit bank-credit expansion, which almost inevitably entails an inflationary increase in the money supply.

This cycle of tight and easy credit is familiar to observers of developing nations, particularly in Latin America. The cycle is especially likely to appear in nations where commercial-bank credit is important, where commercial banks and their creditors are politically powerful, where there are frequent brusque shifts in anticipations and

index-linking. In a regime without index-linking, only equities and real assets are available as a hedge against inflation, and these assets are uncertain hedges at best. The discount on nominal bonds may be increased to take account of an increase in the expected rate of inflation, but the bonds are still subject to the same degree of inflationary uncertainty as money. Where index-linked bonds are available, in contrast, wealth holders can protect their real wealth with certainty by acquiring such bonds. An inflationary deterioration would therefore generate more of a departure from money where index-linked assets are available than where they are not. Moreover, an inflationary deterioration will probably place the commercial-banking system under more acute pressure where index-linked assets are available, because the effective flow of real resources out of the banking system should be far more efficient. Without index-linked assets available, there are considerable transactions costs to obtaining even uncertain protection from inflation for wealth: some real estate must be found, dollars must be purchased on the black market, and so on. Index-linked securities, on the other hand, would be liquid, legal, readily available in any denomination, and virtually perfect hedges against inflation. Money holdings can be converted all too easily into index-linked assets. Consequently the real value of each new injection of money into the banking system will be decreased, through increases in the price level, far more rapidly as people move their wealth out of money and into index-linked assets.

To summarize, the introduction of financial index-linking diminishes the inflationary consequence of an inflationary deterioration on savings and investment (i.e., on the "IS"), but augments the inflationary con-

aggregate-supply conditions, and where the monetary authority lacks institutional power.¹²

Now let us suppose that index-linked financial assets become available in the economy. How would this change the inflation-feedback mechanisms that we have described?

First, consider the savings and investment functions. If the savings media are index-linked, then an inflationary deterioration should have no effect on the expected real rate of interest on savings: an index-linked fixed-return asset is, virtually by definition, an asset with a certain, fixed real rate of return. Hence there should be relatively little reason for savings to decrease following an inflationary deterioration. If investment-finance instruments are index-linked, capital investors should reason that, to the extent that higher future returns anticipated on a given investment project are part of an anticipated inflationary trend, these returns would go to pay the cost of the finance. Moreover, if index-linked assets compete with equities in the financial markets, increases in inflationary expectations and uncertainty should have a smaller positive effect on the valuation of equity. Consequently, an inflationary deterioration should have a smaller inflationary effect on savings and investment in a regime with index-linking than in a regime without index-linking. (For future reference, note that the bulk of Brazil's investment-financial instruments are not index-linked, although medium-term government bonds and savings instruments are index-linked.)

On the other hand, an inflationary deterioration should have a greater inflationary effect on the demand for and supply of money in a regime with

oil prices inevitably had a cost-inflationary effect.¹⁴ In April 1974 there was a major bank failure: one of the nation's largest banking houses, the Halles Group, was placed under "intervention" by the monetary authority, and a large quantity of credit expansion had to be permitted in order to prevent the Halles failure from generating a wider financial panic. Several actions of the new government that took office in March 1974 probably also had inflationary consequences. Beginning with the annual minimum-wage adjustment of May 1974, the government began to set rather higher guidelines for collective wage contracts, in an attempt to increase real wages (both on the view that since 1964 labor had not received a fair share of the nation's economic expansion and in the hope that increased wages would generate greater consumer demand). In August 1974 the government published its "Second National Development Plan," through which it hoped, first, to de-centralize Brazil's industrial growth away from the congested Rio de Janeiro-São Paulo-Belo Horizonte growth poles, and, more important, to promote the nation's basic-inputs industries, whose growth had lagged dangerously behind that of Brazil's consumer-durables industries. Now one of the aims of the new five-year plan was to forestall the inflationary pressure that the structural imbalance seemed to be generating. Ironically, however, the very announcement of the Second National Development Plan probably itself constituted an inflationary shock. The plan was not only extremely ambitious; it assigned the key role to new investments by industries owned by the government, to be financed by funds captured by the government's development banks. Accordingly, it generated widespread fears in Brazil's already hard-pressed private sector that its demand for credit would be crowded out. (In

sequence of an inflationary deterioration on the demand for and supply of money (i.e., on the "LM"). Without additional information, however, we cannot say whether the effect on the IS of introducing financial index-linking would be more important than the effect on the LM.¹³ Therefore, we cannot say for sure whether index-linking renders the inflation-feedback mechanism more or less robust.

II. The inflation-feedback mechanism in recent Brazilian experience.

In this Section we consider the facts of the recent Brazilian inflationary experience. We begin by describing the "inflationary deterioration" that set off the resurgence of inflation in 1974. We then describe the evidence from Brazilian financial statistics that the demand-for-money function was shifted back by the inflationary deterioration. Next, we provide evidence that the Brazilian banking system went into a liquidity crisis at the end of 1974, and that the monetary expansion of 1975 was a response to this crisis. Finally, we briefly review Cláudio Contador's empirical evidence against the view that index-linking has turned Brazil's inflation-feedback mechanism more robust: we argue that Contador's results do not really contradict the analysis of the present essay.

A. The "inflationary deterioration" of 1974.

A number of inflationary shocks occurred during 1973 and 1974 in the Brazilian economy. All of them probably contributed to the 1974 resurgence of inflation, although their relative importance is open to question. The first inflationary shock was the world oil-price increase in October 1973: since Brazil is heavily dependent on oil imports (about 80 per cent of Brazil's oil consumption must be imported), the heavy increase in world

The relative importance of the changes that we have noted in setting off Brazil's inflationary resurgence is open to debate. (It is worth noting, however, that for once in Latin-American inflationary experience a government-budget deficit cannot be held to blame for an inflation: beginning in 1973 Brazil's annual federal budget has actually been in surplus.) But there can be little doubt about their consequences: in 1974 and 1975 Brazil's general price index rose by 34.5 per cent and 29.2 per cent respectively, whereas the rates of increase for 1970, 1971, 1972 and 1973 had been 19.2, 19.8, 15.5 and 15.7 respectively. Furthermore, the rate of inflation worsened in 1976: for that year the general price level rose 46.4 per cent, and only with great difficulty the government managed to reduce the rate of price increase to 29.2 per cent in 1977. Now in view of the inflationary shocks of 1973 and 1974 it was quite understandable that Brazil's rate of inflation rose sharply in 1975. But how are we to explain the sustained inflation after 1974? Our argument is that during 1974 and 1975 the inflation-feedback mechanism propagated the inflationary shocks of 1973 and 1974 forward through time. Since index-linked financial assets were available in Brazil, the inflation-feedback mechanism operated principally through the demand-for-money and the supply-of-money functions. Let us examine each of these in turn.

B. The Brazilian demand-for-money function in 1974.

The basic data for the analysis of the Brazilian demand for money are presented in Tables 9-13. As inflation, inflationary expectations, and inflationary uncertainty rose during 1974, following years of declining rates of inflation, the Brazilian public responded by shifting its wealth

the event the Plan proved too ambitious to carry out, and by 1975 it was largely allowed to lapse.) Yet another event that was probably a kind of inflationary shock came in November 1974: in spite of the opposition of a good part of military and business opinion, the government carried out the first relatively free nationwide elections for congress since 1965. The opposition political party made important gains throughout the nation, and Brazilian business passed through a period of considerable uncertainty, concerned that the changed political equation might have unfavorable consequences.¹⁵

The situation was complicated by the growing problems in Brazil's international economic sphere. Since 1968 Brazil had maintained real output growth above nine per cent per year, led in large part by expansion of exports. Brazil managed to maintain its output growth through most of 1974—for the year as a whole its real national product grew 9.5 per cent. But the OECD nations, Brazil's main customers, reported a reduction of 0.2 per cent in their incomes, and moreover had to direct a larger share of their import expenditure to oil. Brazil's non-oil imports continued to increase, and at first the government took no steps to contain this increase because it still felt that it could still maintain export growth. On top of the credit expansion permitted by the government to relieve the confidence crisis caused by the Ralles collapse, the government allowed credit to expand to agricultural and industrial exporters, in part to tide them over while foreign demand remained in recession, in part to stimulate export production. In the event Brazil had a current-account deficit of almost US\$7 billion in 1974, compared with a deficit under US\$2 billion the previous year; and the nation's total foreign debt rose from US\$12.6 billion to US\$17.2 billion.¹⁶

by 3.5 per cent in real terms, whereas in 1971, 1972 and 1973 their total real deposits had increased by 17.8, 23.2, and 20.7 per cent respectively. (See Table 11.) Real deposits in the Banco do Brasil, the government's commercial bank, increased by 5.1 per cent over 1974 (see Table 13), compared with increases of 7.2 and 32.2 per cent in 1972 and 1973; virtually all of the 1974 increase took place during the first three months of the year. During 1974 the Brazilian public was allowing its real money balances to fall slightly, despite an increase in real gross national product of 9.5 per cent, just as it was allowing its real holdings of non-monetary nominal assets to fall. This was the natural effect on the demand for money of the inflationary deterioration in an economy in which index-linked assets were available.

This interpretation of the shift in Brazilian asset-holding patterns begs a number of interesting questions. Before discussing the consequences of the inflationary deterioration on the supply of money, let us digress to consider these.

First, why couldn't the rates offered on nominal assets simply rise to meet the competition of index-linked assets? It is clear that the nominal rates on time deposits with pre-fixed index-linking were barely permitted to rise at all during 1974, and the effective prohibition on paying interest on commercial-bank demand deposits was maintained as before. For want of data, it is not possible to determine the precise response of the discount on such short-term nominal securities as exchange acceptances and certificates of deposit during 1974; although it apparently rose slightly it could not rise sufficiently to stem the shift of investors away from holding these assets.

out of monetary and other nominal assets and into index-linked assets. The magnitude of the shift can be seen in Tables 9 and 10. In Table 9, we can observe that while in 1972 and 1973 roughly 24 per cent of gross domestic savings was carried out in the form of nominal non-monetary assets (i.e., nominal time deposits, with pre-fixed index-linking; exchange acceptances; and government bills), in 1974 only 9 per cent of gross domestic financial savings was carried out in this form. Table 10 provides evidence for a related point: during 1974 the nominal stock of passbook-savings accounts in the Housing Finance System increased by 104.8 per cent, the nominal stock of private holdings of index-linked government bonds increased by 58.3 per cent, and the nominal stock of private holdings of index-linked state and municipal bonds increased by 67.6 per cent; at the same time the nominal stock of nominal time deposits increased only 8 per cent, the nominal stock of exchange acceptances increased by 22.4 per cent, and the nominal stock of government bills held by the public increased by 14.2 per cent. Since the general price level rose by 34.5 per cent over 1974, it is clear that in real terms the stock of each category of index-linked assets rose considerably, while the stock of each category of non-monetary nominal assets actually declined.

Most interesting for our purposes, the inflationary deterioration clearly affected the demand for real money balances adversely. In real terms the money supply (M-1) actually fell by 0.8 per cent over 1974, even though the nominal money supply increased by 33.5 per cent. For comparison, during 1972 and 1973 the real money supply had increased by 19.7 and 27.0 per cent respectively. (See Table 12.) Private commercial banks were particularly hard-pressed: over 1974 their total real deposits fell

bank would tend to prefer not to: higher lending rates would increase the likelihood that creditors would default, particularly in view of the uncertain circumstances and the real-price "dispersal" that inevitably accompany an increased rate of inflation. Furthermore, a commercial bank would have to change its deposit rate frequently and perhaps very sharply in order for its deposit accounts to compete with index-linked assets. Nominal assets compete disadvantageously with index-linked assets in a period of rising inflation, not only because the expected real rate of interest on nominal assets cannot match the rate offered on index-linked assets, but because the real rate on a nominal asset is uncertain, whereas the real rate on an index-linked asset is not. Thus if commercial banks were to attempt to compete with index-linked assets through the deposit rate, they would have to offer a relatively high nominal rate--some component of which would in effect be a risk premium to the depositor--and they would have to vary the rate frequently. This would turn the banks' operations unacceptably volatile.

Non-bank financial intermediaries are in a somewhat more difficult position, because they do not receive transactions balances. They can still function in an inflationary context with relatively low rates on the instruments that they sell to the public, however, mainly because their largest purchasers are enterprises with fluctuating cash balances. Such enterprises should be willing enough to purchase short-term nominal securities, because they are liquid, and because even if their real rate of return is negative, it will assuredly be higher by their nominal rate than the real rate of return on money. In Brazil the lending rates of the non-bank financial intermediaries are generally controlled by the monetary authority, and the competing bank-loan rates are usually relatively low

In part, the problem was that controls were retained throughout the year on the loans financed by these securities. (See Table 13.)

There are some fundamental reasons why the rates on nominal assets could not rise to meet the competition of index-linked assets.¹⁷ Consider the situation of commercial banks. The deposit rate in Brazilian commercial banks was limited, by regulation, to zero; but in any case these banks had little incentive to raise their deposit rates in response to increased inflation. Their lending rates were subject to official controls through the mechanism of pre-fixed index-linking (although to some extent the banks were able to earn more than the legal limit through such devices as banking commissions and compensating balances, and besides, Brazilian commercial banks have traditionally rationed credit heavily). In these circumstances the banks' profit rates were at least adequate, regardless of the rate of inflation, because whatever increased inflation took from the real rate of interest earned by the banks on their loans it also took from the real rate of interest paid by the banks on their deposits. It makes little difference to a bank if it "earns," say, real interest of minus 10 per cent on its loans if it "pays" real interest of minus 40 per cent on its deposits--it is still earning a spread of 30 per cent. And even if the real deposit rate is very negative, commercial banks will not find themselves entirely without funds, for the public must hold some demand deposits for transactions purposes.

True, a bank might be able to attract more resources if it offered a higher rate of return on its deposits, and these resources could probably be lent out profitably. But a commercial bank that paid a higher deposit rate would have to charge a higher lending rate, and a risk-averse

unit would be changed: instead of the cruzeiro, the monetary unit would effectively become the index-linked cruzeiro. Prices would then come to be set in terms of index-linked cruzeiros, and the true measure of inflation would be the index-linked cruzeiro price index. The ordinary cruzeiro-price index would be irrelevant. Whatever previously caused inflation through creation of cruzeiros would now cause inflation through creation of index-linked cruzeiros, and the economy would be right back where it started before index-linking was introduced. This observation amounts to a description of what index-linking really is: index-linking is the institution of a second monetary unit alongside the unit of the circulating medium. The advantages and problems of index-linking both arise from the fact that while this second monetary unit is not subject to inflationary uncertainty, the exchange rate between the two monetary units is subject to inflationary uncertainty; moreover, the second monetary unit cannot be used for transactions purposes.

C. The Brazilian supply of money, 1974-1976.

The radical shift in asset-holding patterns that took place during 1974 inevitably brought a more institutional inflation-feedback mechanism into play: the monetary authority found itself forced to permit the inflation to continue. There were further inflationary shocks after 1974: for example, in mid-1975 there was a series of agricultural disasters throughout the country, which not only caused supply problems but occasioned an inflationary credit expansion. We will argue here, however, that the shift in asset-holding patterns in 1974 was, by itself, a significant source of pressure on the monetary authority to inflate.

for the reasons we have given. (On the other hand, the demand for credit from non-bank financial intermediaries is always heavy, particularly because of the banks' rationing practices, and there is usually considerable upward pressure on the lending rates.) Again, as long as they maintain a positive spread between their lending and borrowing rates, non-bank financial intermediaries can maintain themselves well enough even if their borrowing rate is negative. The situation of such financial institutions is more precarious than that of commercial banks, and the more so where there is inflation. Marketable paper can carry a discount, and so the real interest rate in this market can vary much more than the real rate on bank deposits. The discount notwithstanding, money-market instruments will be able to compete effectively with index-linked assets only if they are sold for very short terms. For longer terms the inflationary uncertainty attaching to the real rate on nominal paper becomes too high.

But then, one might ask, why not institute index-linking more comprehensively--why not require commercial banks and non-bank financial intermediaries to index-link both their lending and deposit rates? For one thing, short-term borrowers would not stand for it. Commercial credit is generally re-paid from sales and accounts receivable: by their nature, these cannot be made proof against inflation. But even if commercial-bank loans could be index-linked, it must be remembered that a significant part of commercial banks' assets are held in the form of cash--required reserves and vault cash. In order for commercial banks to index-link their demand deposits, their reserves must be index-linked--which is to say, the money supply as a whole must be index-linked. But that would be pointless. If the currency unit were index-linked, the currency

temporary relief to the banks without--it was hoped--interfering with the government's longer-run stabilization effort. Altogether an amount equal to approximately 10 per cent of the money supply was loaned out under the facility to the commercial banks, who used it to expand their loans. (See Table 11.) The increased liquidity had a stimulating effect on the economy, and although it was of course inflationary, the government hoped that it could reign in the money supply again when conditions improved. Unfortunately, the availability of index-linked assets maintained the inflation-feedback mechanism as robust as ever: the stock of index-linked assets grew by almost as much as it had in the previous year (see Table 10), and the real money supply increased very slowly (see Table 12), barely making up the fall in the real money supply during the first part of the year.

A further development complicated the financial situation in 1975. During this year the money markets turned hyper-active in Brazil's principal financial centers. The money market's rates and volumes rose heavily, and became highly variable; the maturities of money-market paper shortened drastically. Non-bank financial intermediaries came increasingly to employ a characteristically new mode of operation in their competition for resources with index-linked assets: the "re-purchase letter." The re-purchase letter was a document accompanying the sale of a security, such as an exchange acceptance or a certificate of deposit, promising that the seller of the security would re-purchase the security after a given number of days at a specified price. In such a transaction the re-purchase letter became the true financial instrument, and the security merely collateral. Since the re-purchase letters were generally of extremely short maturity,

It is clear that by the end of 1974 the government had become painfully aware that the shift out of nominal assets into index-linked assets was causing a liquidity crisis in the banking system and causing severe problems for the financial system generally.¹⁸ In November 1974 the government took several measures to mitigate the asset shift: the National Housing Bank effectively prohibited anyone but private individuals from maintaining index-linked passbook savings accounts in the Housing Finance System, and also reduced the grace period after the start of each month for deposits in passbook savings accounts during which new deposits would be treated as though they had been made on the first of the month.¹⁹ The critical problem was the situation of the commercial banks, however. The demand for loans that they faced rose considerably throughout the year, undoubtedly by considerably more in nominal terms than the rate of increase in view of the severe real economic problems, while deposits fell in real terms. The banks clearly tried to meet some of this loan demand. For the first time their ratio of loans to deposits rose above one, and their real loans increased. (See Table 11.) By the beginning of 1975 their credit tightness had reached severe proportions, and there is clear evidence that after October 1975 the economy suffered an industrial recession that threatened to become very serious.²⁰

This situation left the monetary authority little choice. Hence, in late February 1975 it began an expansionary monetary policy by reducing required reserve ratios. The magnitude of the expansion was increased during March and April, when a special six-month loan facility was made available to the private commercial-banking system. This facility, known as the "Compensatory Re-financing," was intended to provide

and providing emergency loans to others since the Halles collapse in 1974, and during 1975 and 1976 it had to provide increased support: during these two years the monetary authority's credits to non-bank financial institutions increased by 71.4 and 150 per cent respectively. These credits alone amounted to 19 and 36 per cent of the respective increases in the monetary base in these two years, and therefore must be regarded as a major cause of the 46.4 per cent increase in the general price level that occurred over 1976. (The remainder of the 1975 and 1976 growth in the monetary base is accounted for by Central Bank credit to commercial banks, the expansion of demand deposits/credit of the government-owned Banco do Brasil, and--after 1976--the growth of foreign reserves. Since the Banco do Brasil is not subject to the required-reserve ratio, its deposits are part of the monetary base. And although to avoid complication we have deliberately avoided discussing Brazil's foreign financial relations in this essay, it should be noted that Brazil is very much an open economy where credit is concerned: foreign banks have remained willing to supply credit to Brazil in spite of Brazil's economic difficulties, and so at times when domestic credit became tight, Brazilian enterprises naturally turned to foreign sources.)

To summarize, the role of financial index-linking in forcing increases in the Brazilian money supply must be regarded as critical. Simply put, the availability of index-linked assets placed severe pressure on monetary institutions whenever there was an inflationary deterioration, as the Brazilian public sought to reduce its real money holdings in favor of index-linked assets. The Brazilian monetary authority has been obliged to respond to the run from real money by replenishing the money supply,

their real rate of return was subject to relatively little inflationary uncertainty. Thus they could compete effectively with index-linked assets. Their drawback, of course, was that they went to finance business and commercial loans of longer terms, while the money-market rates might fluctuate considerably. Funds were thus attracted back into the nominal sector of the economy, particularly since firms could no longer hold funds in passbook savings accounts, and since the public believed, in view of the fact that the government was carrying out an expansionary monetary policy, that it was best to buy such securities now before their real rates of return went down. This money market has come to be known in Brazil as "O Open Market" (the English expression is used), because it employs the same financial infrastructure that is used for transactions in the government's (nominal) bills and (index-linked) bonds.

Severe problems developed toward the end of 1975, however, when the government shifted course and tried to return to a contractionary monetary policy. At the same time the "Compensatory Re-financing" loan came due; in anticipation of the due date of the huge facility, the banks had gone heavily into government bills. Between, roughly speaking, September and November, a massive amount of paper poured on to the Open Market, as the commercial banks sought to go into cash to pay back the loan and investors sought to dispose of securities that would probably now suffer a capital loss. As the short-term rates rose sharply, many financial institutions found themselves in deep trouble. This event is generally described as the first "Open crisis"—further crises were to ensue in 1976 as the monetary authority tried to tighten its policy but sometimes had to loosen credit. The monetary authority had been intervening in some financial institutions

rates of inflation (which stands to reason, since the adjustment of index-linked assets is based on a moving average of the rates of inflation between three and six months before); (ii) quarterly regression analysis using an Almon lag shows a weak, statistically not significant relationship between the current rate of inflation and lagged rates of adjustment; and (iii) spectral analysis finds that the rate of adjustment has no leading effect on the current rate of inflation, either for short- or long-run analysis. Contador concludes that "the empirical tests leave little margin of doubt that index-linking does not feed back into the inflationary process in Brazil."²³ How can we reconcile his results with the analysis that we have given above?

As follows: Dr. Contador and the present writer are really discussing two different feedback processes. Dr. Contador's empirical analysis establishes that the adjustment of index-linked assets does not apparently propagate inflation through time. This stands to reason, especially in view of the way that index-linking has been implemented in Brazil. Since commercial, industrial, and agricultural credit is generally not index-linked, there is little reason for adjustment of index-linked assets to be translated into cost pressure; moreover, the additional income received by savers and financial investors on index-linked assets is generally also saved, and thus adds little to aggregate expenditure. The argument of the present essay, on the other hand, is that the availability of index-linked assets, rather than their adjustment per se, is a key element in the inflation-feedback process: earlier increases in the rate of inflation, operating through formation of inflationary expectations and uncertainty, affect the current rate of inflation

and this served to propagate the inflation forward through time. The Brazilian government has been well aware that index-linked assets have been placing a severe strain on the nation's financial system: in August 1975 it announced that henceforth it reserved the right to edit "accidental" price increases, i.e., price increases resulting from aggregate-supply shocks such as the agricultural disasters of that year, out of the index; and in April 1976 the government made a more drastic change, announcing that henceforth index-linked assets would be corrected according to the formula

$$(.8 \cdot I + .2 \cdot 15) \text{ per cent (in annual terms),}$$

where I is the rate of increase that would previously have been applied to index-linked securities.²¹ The stated purpose of these changes was to reduce inflation feedback and to relieve the competitive pressure that financial institutions faced from index-linked assets. It is not clear, however, how much farther the government can go in the direction of making index-linked assets less attractive, since the Housing Finance System, the forced-savings funds, and other institutions have so strong a vested interest in them.

D. On the evidence from statistical analysis.

In a recent paper Cláudio Contador presented a statistical analysis of the relationship between two Brazilian time series, the rate of inflation and the percentage adjustments applied to outstanding index-linked assets.²² Contador's results may be summarized briefly as follows:

(1) quarterly regression analysis using an Almon lag shows a strong positive relationship between the current rate of adjustment and lagged

substitute for government policy to control the basic causes of inflation. Index-linking may be a sensible expedient for a serious stabilization program, where inflation expectations and uncertainty are coming down. It is not a magical device for living painlessly with continuing inflation.

by stimulating asset-holders to move out of money and into index-linked assets, thereby effectively decreasing the real value of money and forcing the monetary authority to increase the money supply.

Conclusion.

We have argued that our evidence from Brazil's recent inflationary experience suggests strongly that the "inflation-feedback" mechanism has operated there since 1974 through the availability of index-linked assets. Does this conclusion amount to an argument that no nation should introduce financial index-linking? It is difficult to say. In the first place, as we observed in Section I, we cannot show that the inflation-feedback mechanism must be more robust where index-linked assets are available than where they are not available. And second, it cannot be emphasized too strongly that as long as the rate of inflation remains short of hyper-inflationary levels, financial index-linking permits accumulation of savings and government borrowing from the public. One must retort, however, that at the same time the competition of index-linked assets places severe stress on the operations of financial enterprises that operate with nominal instruments, and forces the economy to operate with two currency units with a variable and uncertain exchange rate--to the inevitable detriment of the transactions-currency unit.

In sum, financial index-linking has its advantages and its drawbacks. On the one hand, it preserves the value of the national savings stock in an inflationary context. On the other hand, it acts to debase the national currency and to snarl up the national financial system. The real conclusion, perhaps, is that for the long run there can be no

Siegel (1974), Fischer (1975), and Blinder (1977). See Liviatan and Levhari (1977) for an analysis basically in agreement with the view of this writer. The Brazilian attempt to introduce private index-linked securities is described in "A Nova Lei do Mercado de Capitais e a Resolução No. 21 do Conselho Monetário," Conjuntura Econômica, March, 1966, pp. 9-12. See also Syvrud (1972), pp. 124-126.

6. See Syvrud (1972).

7. See "O Plano de equivalência salarial e a correção monetária," Conjuntura Econômica, March, 1970, pp. 65-68. See also Beckerman, ("Adjustment for Inflation....," 1978).

8. See Contador (1977).

9. See Contador (1977).

10. This is certainly true if inflationary expectations and uncertainty are simply adaptive in character. If inflationary expectations are rational, then there are various possibilities, especially if the rational expectation takes full account of the feedback process. We are assuming simply that, whatever the underlying reason, inflationary expectations are elastic with respect to the rate of inflation.

11. It is theoretically possible, however, that an increase in the uncertainty attaching to the real rate of inflation would increase the demand for money. This could happen if the subjective probability distributions of the real rates of return on money and equities were negatively correlated.

12. The argument that the liquidity condition of banks may vary according the expected rate of inflation is similar in spirit to Irving Fisher's theory of how the business cycle could be propagated through the banking system. See Fisher (1911).

NOTES

1. More detailed histories in English of Brazil's introduction of index-linking are provided in Baer and Beckerman (1974); Beckerman ("The Trouble . . .")(1978); and Fishlow (1974). Histories in Portuguese are given in Chacel, Simonsen, and Wald (1970); Ness (1977); and Simonsen (1975).
2. It is important to understand that this was not really because of the Brazilian usury law, which limited the annual interest on the government's bonds to 12 per cent. Government bonds could always have been sold at a discount to raise their effective yield above the anticipated rate of inflation. What made government obligations unsaleable was the uncertainty associated with the high rate of inflation, which rendered the a priori real rate of return on any fixed-return security unacceptably uncertain to the financial markets. Consequently, it would not have helped much simply to raise the rate of return offered on government obligations. The real rate of return had to be made not only positive, but reasonably certain, and this could be accomplished only by index-linking the securities ex post--that is, readjusting their principals periodically according to an appropriate price index.
3. A history of the formulas that have been used to re-adjust index-linked assets is given in "Correcção monetária e realimentação inflacionária," in Conjuntura Econômica, June 1976, pp. 88-94.
4. Kampel and Miranda do Valle (1974) describes the Housing Finance System in detail.
5. There is a growing literature on the question of why index-linked assets have not appeared spontaneously in private capital markets. See

using the Housing Finance System savings accounts for their spare cash, a use that made the accounts quite volatile and contrary to their purpose.

20. Figures for the consumption of electrical energy in the Rio de Janeiro-São Paulo-Minas Gerais area suggest that there was indeed such a recession.

The figures, in million kilowatt-hours, are

September 1974:	1,663	January 1975:	1,587
October 1974:	1,584	February 1975:	1,586
November 1974:	1,654	March 1975:	1,590
December 1974:	1,581	April 1975:	1,640

(Boletim do Banco Central do Brasil, March, 1977, pp. 149).

21. See "Correção monetária e realimentação inflacionária," in Conjuntura Econômica, June 1976, pp. 88-94.

22. Contador (1977).

23. Contador, p. 15.

13. This writer has developed a model from which formal conditions can be derived under which the effect on the IS of introducing financial index-linking would be more important than the effect on the LM. See Beckerman ("Index-linked Government Bonds . . .") (1978).

14. One might argue that the increase in international oil prices should not be regarded in itself as inflationary, since for any given nation the increase only represented a shift in relative prices. True enough; but in Brazil and in many other nations the shift in relative prices inevitably occasioned an increase in the demand for bank credit, and this caused an increase in the money supply to the extent that the monetary authorities permitted—or were forced to permit—the banking system to meet this demand.

15. See Beckerman, "The Trouble..." (1978) for a slightly more detailed discussion of these developments.

16. See "Brazil counts its debts," The Economist, March 13, 1974, pp. 77-78.

17. Ness (1977) argues that the failure of nominal rates to rise sufficiently was a major cause of the problems faced by the Brazilian financial system after 1974.

18. See Conjuntura Econômica, October 1974, p. 48.

19. The new ruling provided that index-linking and interest would be paid for a given month only on quantities deposited by the fifth of the month, rather than the fifteenth of the month as under the previous regulation. Under the previous regulation savers could profitably invest funds in money-market securities between the first and the fifteenth before returning the funds to the savings accounts, thus earning from two sources on the funds. (See Conjuntura Econômica, November 1974, p. 32.) Enterprises had been

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TABLE 1. Measures of Brazilian inflation, output growth, and money-supply growth, 1961-1976; percentage changes, December/December.

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
(1) General price index	47.7	51.3	81.3	91.9	34.5	38.8	24.3	25.4	20.2	19.2	19.8	15.5	15.7	34.5	29.2	46.4
(2) Wholesale price index	53.2	45.5	83.2	84.5	31.4	42.1	21.1	24.8	18.7	18.7	21.3	16.1	15.6	35.2	29.4	44.9
(3) Cost of living in Rio de Janeiro	42.9	55.8	80.2	86.6	45.5	41.2	24.1	24.5	24.3	20.9	18.1	14.0	13.7	33.7	31.2	44.8
(4) Money supply	52.5	64.1	64.6	81.6	79.5	13.8	45.7	39.0	32.5	25.8	32.3	38.3	47.0	34.0	42.3	37.2
(5) Monetary base	61.8	62.1	69.9	86.2	66.6	26.4	25.2	46.5	29.9	19.4	34.2	25.6	42.7	32.9	36.4	49.8
(6) Real gross domestic product	10.3	5.3	1.5	2.9	2.7	5.1	4.8	9.3	9.0	9.5	11.1	10.4	11.4	9.5	4.2*	8.8*
(7) Implicit deflator	33.3	54.8	78.0	87.8	55.4	38.8	27.1	27.8	22.3	19.8	20.4	17.0	15.5	34.0		

Source: "Inflation in Brazil", by A. Lengruher, in L. B. Krause and W. S. Salant, Worldwide Inflation, pp. 395-448, Tables 1 and 2, pp. 400-401.

*Provisional data. The 1975 figure is given by The Economist, March 13, 1976, p. 77.

The 1976 figure is the preliminary estimate of the Fundacao Getulio Vargas announced in February 1977.

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TABLE 3. Value of government index-linked bonds,
deflated by the wholesale price index and the general price index.*

deflated by: wholesale price index general price index	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
January		8.31 8.39	9.29 9.17	9.15 9.25	9.25 9.12	9.27 9.10	9.28 9.00	9.33 9.00	9.38 9.16	9.30 9.13	9.15 8.98	8.97 8.84	8.65 8.54
February		7.92 8.00	8.75 8.78	9.05 9.06	9.08 8.96	9.28 9.11	9.35 9.07	9.34 9.40	9.30 9.11	9.23 9.06	9.02 8.83	8.92 8.77	8.59 8.44
March		7.78 7.77	8.71 8.67	9.10 9.10	8.96 8.90	9.33 9.11	9.41 9.12	9.32 9.00	9.24 9.05	9.22 9.06	8.91 8.72	8.85 8.73	8.47 8.29
April		8.85 8.70	8.71 8.60	8.99 9.00	8.91 8.85	9.57 9.19	9.33 9.06	9.19 8.88	9.22 9.04	9.20 9.04	8.63 8.45	8.92 8.75	8.36 8.18
May		8.68 8.51	8.59 8.53	8.98 8.92	8.96 8.78	9.61 9.23	9.46 9.10	9.11 8.85	9.25 9.04	9.20 9.01	8.29 8.16	8.95 8.77	8.28 8.09
June		8.54 8.38	8.71 8.69	9.14 8.93	9.13 8.90	9.62 9.24	9.42 9.06	9.07 8.81	9.38 9.11	9.24 9.03	8.14 8.05	8.99 8.79	8.28 8.05
July	10.00 10.00	9.57 9.38	8.90 8.90	9.32 9.11	9.15 8.92	9.48 9.17	9.35 9.00	9.01 8.79	9.46 9.19	9.24 9.03	8.27 8.17	8.92 8.76	8.34 8.07
August	9.41 9.41	9.34 9.14	8.83 8.85	9.26 9.13	9.24 9.01	8.86 9.10	9.26 8.92	9.06 8.84	9.44 9.21	9.22 9.04	8.57 8.42	8.89 8.72	8.20 7.97
September	9.12 9.13	9.51 9.33	8.82 8.93	9.33 9.19	9.29 9.06	9.17 8.92	9.14 8.81	9.18 8.93	9.40 9.14	9.20 9.02	8.87 8.72	8.79 8.62	8.04 7.87
October	8.74 8.79	9.41 9.21	8.90 8.93	9.23 9.10	9.19 9.02	9.06 8.82	9.05 8.73	9.22 9.00	9.35 9.10	9.19 9.01	9.05 8.88	8.74 8.59	8.02 7.87
November	8.35 8.42	9.34 9.15	8.89 8.99	9.16 9.03	9.16 8.94	8.98 8.75	9.11 8.75	9.30 9.08	9.33 9.11	9.11 9.42	9.08 8.95	8.70 8.59	8.13 7.96
December	7.71 7.87	9.34 9.17	9.02 9.12	9.15 9.02	9.15 8.98	9.04 8.80	9.22 8.90	9.33 9.14	9.28 9.08	9.09 8.92	9.06 8.93	8.68 8.56	8.24 8.05

TABLE 2. Nominal value of index-linked government bonds, in cruzeiros.

(After 1966, these were the values of the Standard Accounting Unit, or UPC, of the SFH.)

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
January		11.30	16.60	23.23	28.48	35.62	42.35	50.51	61.52	70.87	80.62	106.76	133.34
February		11.30	17.05	23.78	28.98	36.27	43.30	51.44	62.26	71.57	81.47	103.38	135.90
March		11.50	17.30	24.23	29.40	36.91	44.17	52.12	63.09	72.32	82.69	110.18	138.94
April		13.40	17.60	24.64	29.83	37.43	44.67	52.64	63.81	73.19	83.73	112.25	142.24
May		13.40	18.28	25.01	30.39	38.01	45.08	53.25	64.66	74.03	85.10	114.49	145.83
June		13.40	19.09	25.46	31.20	38.48	45.50	54.01	65.75	74.97	86.91	117.13	150.17
July	10.00	15.20	19.87	26.13	32.09	39.00	46.20	55.08	66.93	75.80	89.80	119.27	154.60
August	10.00	15.20	20.43	26.84	32.81	39.27	46.61	56.18	67.89	76.48	93.75	121.31	158.55
September	10.00	15.70	21.01	27.25	33.41	39.56	47.05	57.36	68.46	77.12	98.22	123.20	162.97
October	10.00	15.90	21.61	27.38	33.88	39.92	47.61	58.61	68.95	77.87	101.90	125.70	168.33
November	10.00	16.05	22.18	27.57	34.39	40.57	48.51	59.79	69.61	78.40	104.10	128.43	174.40
December	10.00	16.30	22.69	27.96	34.95	41.42	49.54	60.77	70.07	79.07	105.41	130.93	179.68

$$V_t = V_{t-1} \cdot \frac{I_{t-1}}{I_{t-2}} \quad (\S)$$

The first figure given for each month in Table 6b is the value:

$$\bar{V}_t = V_t \cdot \frac{I_{\text{June 1964}}}{I_{t-1}} \quad .$$

If the formula (§) had actually been used to adjust the bonds beginning in August 1964, this first figure would be 10.00. To the extent that our calculated figure falls short from 10.00, therefore, the bonds have failed to incorporate the full inflation (measured by the wholesale price index) that occurred since July 1964. To determine the real rate of return (net of interest) on a bond held between times t_0 and t_1 , calculate

$$\frac{\bar{V}_{t_1} - \bar{V}_{t_0}}{\bar{V}_{t_0}} \quad .$$

At least between 1965 and 1974, our table shows that index-linked bonds have pretty much retained their value. Between any given dates, however, the bonds do clearly have real gains or losses. The second figure given for each month shows the value

$$\bar{\bar{V}}_t = V_t \cdot \frac{I_{\text{June 1964}}}{G_{t-1}} \quad ,$$

where G_t is the general price index.

*The interpretation of Table 3: The value of the index-linked bonds has been determined each month by adjusting the previous month's value according to the wholesale price index lagged several months, using the following formula:

$$V_t = V_{t-1} \frac{I_{t-4} + I_{t-5} + I_{t-6}}{I_{t-5} + I_{t-6} + I_{t-7}},$$

where V_t is the value of the bond at time t and I_t is the wholesale price index. (Originally the index-linked bonds were adjusted every three months, according to the formula:

$$V_t = V_{t-1} \frac{I_{t-4} + I_{t-5} + I_{t-6}}{I_{t-7} + I_{t-8} + I_{t-9}} .)$$

The principal changes made in the calculation of the bond values were these: in 1969 a new wholesale price index was used, removing the wholesale prices of goods for export. In 1972 and 1973 a complicated formula was employed, weighting the above formula by 60 percent and making the remaining 40 percent of the formula depend on the government's target for inflation over the coming period. During 1974 the previous formula was adopted again. In August 1975 the wholesale price index was "purged" of price increases deemed to have been the consequence of the agricultural failures that occurred around that time, for purposes of calculating the bond readjustment. After April 1976 the adjustment formula became (approximately):

$$V_t = 0.8 V_{t-1} \frac{I_{t-2} + I_{t-3} + I_{t-4}}{I_{t-3} + I_{t-4} + I_{t-5}} + 0.2 V_{t-1} (1.15)^{\frac{1}{12}}.$$

If the bonds were perfect hedges against inflation, the correction formula would be:

TABLE 5. The Brazilian Federal Deficit and Its Finance. (Millions of new cruzeiros).

	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-10-	-11-	-12-
	Revenues	Expenditures	Surplus or deficit (1)-(2)	Gross domestic product	(2)÷(4)	(3)÷(2)	(3)÷(4)	Financed by monetary authorities	-[(8) ÷ (3)]	Financed by public borrowing	-[(10) ÷ (3)]	(9)+(11)
966	5910	6496	-586	53724	0.12	-0.09	-0.01	-190	-0.32	606	1.03	0.71
967	6814	8039	-1225	71486	0.11	-0.15	-0.02	716	0.58	509	0.42	1.00
968	10275	11502	-1227	99879	0.12	-0.11	-0.01	1089	-0.88	138	0.11	0.95
969	13953	14709	-756	155695	0.09	-0.05	-0.00	-733	-0.97	1489	1.97	1.00
970	19194	58872	-738	206565	0.29	-0.01	-0.00	-839	-1.14	1577	2.13	0.95
971	26980	27652	-672	274267	0.10	-0.02	-0.00	-2022	-1.87	2694	4.00	2.11
972	37738	38254	-516	359133	0.11	-0.01	-0.00	-7685	-14.89	8201	15.89	1.00
973	52863	52568	295	477163	0.11	0.01	0.00	-6499	22.03	6204	-21.03	1.00
974	76810	72928	3882	676617	0.11	0.05	0.01	-8790	2.26	4908	-1.26	1.00
975	95446	95373	73	897194	0.11	0.00	0.00	-16356	224.05	16283	-223.05	1.00
976	166220	165797	423	1397829	0.12	0.00	0.00	-18594	43.96	19955	-47.17	-3.21

Source: Boletim do Banco Central do Brasil.

TABLE 4. Internal debt in government securities, 1964-1976.

	Government obligations outstanding			Net sales of government obligations		Average maturity of		Gross		"Non-identified"		(11) (1)
	Index-linked bonds -1-	Treasury bills -2-	Total -3-	Index-linked bonds -4-	Treasury bills -5-	Total -6-	outstanding obligations -7-	outstanding obligations -8-	domestic product -9-	(3)† (9) percentage -10-	holdings of government bonds -11-	
1964	41		41	40		40	59m21d		23056	0.0	30	0.7
1965	430		430	337		337	47m 9d		36818	0.1	314	0.7
1966	1401		1401	629		629	24m12d		53724	2.6	822	0.59
1967	2482		2482	448		448	24m21d		71486	3.5	894	0.5
1968	3491		3491	93		93	24m12d		99879	3.5	1625	0.6
1969	5881		5881	797		797	20m 9d		155695	3.8	2169	0.7
1970	9412	700	10112	1624	658	2282	17m11d	20d	206565	4.9	3859	0.4
1971	11565	3880	15445	290	2697	2987	16m11d	1m13d	274267	5.6	4364	0.3
1972	15975	10204	26179	1792	5094	6886	21m23d	2m20d	359133	7.3	3493	0.27
1973	20944	17400	38344	1156	4601	5757	27m22d	3m21d	477163	8.0	3824	0.18
1974	32969	14800	47801	2539	-5166	-2595	31m 2d	3m 4d	676617	7.1	8412	0.26
1975	60112	37400	97548	15311	16388	31649	37m29d	3m14d	897194	10.9	12342	0.29
1976	84397	69404	153869	-2467	13236	10814	31m28d	3m19d	1397829	11.0	15949	0.19

Source: Banco Central do Brasil:
Relatório Anual: 1972, pp. 131-133; 1976, pp. 163-165; 1977, pp. 135-137.

TABLE 7. Loans by the Housing Finance System to final borrowers, 1965-1976. (Millions of new cruzeiros)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Housing Bank total loans	19	89	451	1873	3582	6231	9927	14295	20620	34062	53250	92836
		+368.4	+406.7	+315.3	+91.2	+74.0	+59.3	+44.0	+44.2	+65.2	+56.3	+74.3
Housing Bank loans to final borrowers	19	72	303	993	2006	3762	5808	6057	7370	9286	11799	17584
		+278.9	+320.8	+227.7	+102.0	+87.5	+54.4	+4.3	+21.7	+26.0	+27.1	+49.0
Loans by Housing-Finance-System agencies:												
a. Federal Savings Bank	38	408	1771	3465	5839	10038	18386	30982	55552	89794	173424	
		+973.7	+334.1	+97.7	+68.5	+71.9	+83.2	+68.5	+79.3	+61.6	+93.2	
b. Savings Banks of states	23	133	484	958	1736	2752	3942	5725	10375	21122	45201	
		+478.3	+263.9	+97.9	+81.2	+58.5	+43.2	+45.9	+80.4	+103.6	+114.0	
c. Real estate credit societies	11	65	238	456	401	757	1237	2426	4725	7802	19326	
		+490.9	+266.2	+91.6	-12.0	+88.8	+63.4	+96.1	+94.8	+65.1	+147.7	
d. Savings and loan associations	4	196	763	1362	2284	3958	8624	14535	23330	32728	55126	
		+4800.0	+289.3	+78.5	+67.7	+73.3	+117.9	+68.5	+60.5	+40.3	+68.4	
		32	178	345	568	1436	2649	4834	7876	15684	+99.1	
			+456.3	+93.8	+64.6	+152.8	+84.5	+82.5	+62.9			
Total loans by the Housing-Finance-System	19	110	711	2764	5471	9601	15846	24443	38352	64838	101593	191008
		+473.9	+546.4	+288.7	+97.3	+75.5	+65.0	+54.3	+56.9	+69.1	+56.7	+88.0
Total loans by the Housing-Finance-System deflated (general price index)	19	81.8	381.1	1191.7	1881.6	2746.4	3715.4	4896.8	6652.9	7224.5	8760.6	11252.5
Gross domestic product	36818	53724	71486	99879	155695	206565	274267	359133	477163	676617	897194	1397829
Deflated (gen. p. index)	36818	38920.3	40378.4	45416.7	58628.9	64933.2	71586.7	80139.9	92490.3	101915.4	105819.1	116701.0
Δ real loans (real g.d.p.)		0.00	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02
Δ(5) + (7)												

Includes loans made by the Housing-Finance-System through commercial banks, development banks, and investment banks.

TABLE 6. The National Housing Bank, 1966-1976. (Millions of new cruzeiros, and as a percentage of total assets).

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Assets											
1. Liquid assets	31	43	39	41	30	24	60	133	737	380	254
	0.20	0.05	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.00
2. Re-financings	89	451	1873	3582	6231	9927	14205	19839	34062	53250	92836
	0.57	0.46	0.79	0.81	0.84	0.84	0.77	0.75	0.74	0.76	0.79
a. State housing companies	50	171	438	703	1412	1883	2374	2958	4142	5632	9366
	0.32	0.18	0.18	0.18	0.19	0.16	0.13	0.11	0.09	0.08	0.08
b. Caixa Econômica (state & federal)	16	221	461	662	690	625	754	709	1486	2600	6582
	0.10	0.13	0.19	0.15	0.09	0.07	0.04	0.03	0.03	0.03	0.05
c. Housing cooperatives	14	68	224	691	1147	1981	2876	3462	3727	3431	2917
	0.09	0.07	0.09	0.14	0.15	0.17	0.16	0.13	0.08	0.05	0.02
d. Real estate credit societies	1	13	148	286	482	951	3377	5344	8190	13155	20933
	0.01	0.01	0.06	0.07	0.06	0.08	0.18	0.20	0.18	0.19	0.18
e. Savings and loan associations		17	17	117	224	340	960	1550	2812	5430	9650
		0.01	0.01	0.02	0.03	0.03	0.05	0.06	0.06	0.08	0.08
f. Commercial banks							2047	3927	8925	15333	31535
							0.11	0.15	0.19	0.22	0.27
g. Investment banks							783	1369	2487	3041	2978
							0.04	0.05	0.05	0.04	0.03
h. State development banks							317	351	876	1892	3574
							0.02	0.01	0.02	0.03	0.03
3. Security holdings	27	416	425	688	1047	1697	3702	4951	8715	11485	13604
	0.17	0.45	0.18	0.16	0.14	0.14	0.20	0.19	0.19	0.16	0.12
4. Total assets	155	934	2371	4389	7431	11888	18397	26384	46180	70394	117657
Liabilities											
5. Own resources	110	185	310	526	942	1553	2527	4354	9228	13558	20007
	0.71	0.20	0.13	0.12	0.13	0.13	0.14	0.17	0.20	0.19	0.17
6. Social-security program accounts		629	1902	3611	6040	9813	14788	20982	32897	48413	79011
		0.67	0.80	0.82	0.81	0.81	0.80	0.80	0.71	0.69	0.67

TABLE 9. Gross national financial savings, 1972-1976.
(Millions of new cruzeiros) (provisional data)

Yearly flows	1972	1973	1974	1975	1976
1. Monetary assets	17564	30006	31350	54152	67501
2. Time deposits*	7527	8794	7660	21097	18982
3. Exchange acceptances	6897	13847	7788	13201	11789
4. Government bills	6300	7196	-2599	22599	32500
5. Nominal fixed yield assets: (2)+(3)+(4)*	20724	29837	12849	56897	63271
6. Savings deposits	3952	6409	14803	26309	51397
7. Housing bonds	1887	1502	1770	650	681
8. Government bonds	4410	4968	12057	27147	24612
9. Index linked assets: (6)+(7)+(8)	10249	12879	28630	54106	76600
10. Forced savings programs	7419	10968	21593	29471	54525
11. Insurance companies' technical reserves	316	276	545	802	756
12. Variable yield securities	28282	42857	53362	83324	66950
13. Gross domestic financial savings	84579	126823	148329	278752	329693
14. Gross foreign financial savings	17636	17152	36665	34773	25622
15. Gross financial savings	102215	143975	184994	313525	355315
16. Gross domestic product	359133	477163	676617	897194	1397829
17. (5) ÷ (13)	0.24	0.24	0.09	0.19	0.19
18. (5) ÷ (15)	0.20	0.21	0.07	0.17	0.18
19. (5) ÷ (16)	0.06	0.06	0.02	0.06	0.05
20. (9) ÷ (13)	0.12	0.10	0.19	0.19	0.23
21. (9) ÷ (15)	0.10	0.09	0.15	0.17	0.22
22. (9) ÷ (16)	0.03	0.03	0.04	0.06	0.05
23. (13) ÷ (16)	0.23	0.27	0.22	0.31	0.24
24. (15) ÷ (16)	0.28	0.30	0.27	0.35	0.25

*Certain time deposits at investment banks yield ex post index linking. These are small in quantity. These are included with nominal time deposits.

Source: Boletim do Banco do Brasil, March 1977.

TABLE 8. Index linked passbook saving accounts in the Housing Finance System, 1970-1976.

	Number of accounts (thousands)			Average balance (new contracts)			Total (millions of new contracts)			Nominal return, previous 12 months						
	Savings Banks	Real estate credit societies	Savings and Totals loan assoc.	Savings Banks	Real estate credit societies	Savings and Totals loan assoc.	Savings Banks	Real estate credit societies	Savings and Totals loan assoc.	Real estate credit societies	Savings and loan assoc.	General price index				
December:																
1970	998	153	163	1349	1801	851	822	1550	1797	160	134	2091	26.3	28.7	28.4	19.2
1971	1529	376	336	2239	2131	814	650	1689	3258	306	217	3781	30.3	32.7	32.4	19.8
1972	1900	771	563	3234	3366	1067	888	2387	6395	823	500	7718	25.6	26.9	26.7	15.5
1973	2450	1315	832	4337	4201	1759	1138	2919	10640	2710	947	14118	19.7	22.0	21.7	15.7
1974	3239	2414	1153	6806	6520	2501	1534	4750	21118	6037	1769	28924	38.4	40.9	40.4	24.5
1975	4442	3840	1656	9938	8950	3186	1958	5558	39756	12234	3242	55233	30.5	32.3	32.7	29.2
1976	5602	5733	2338	14142	13313	4590	3078	7915	74579	26314	7169	111934	41.4	41.4	43.7	46.4

*Includes other Housing-Finance-System agencies.

Source: Boletim do Banco do Brasil, April 1977.

TABLE 11. Private commercial banks operating in Brazil, 1970-1976. (Millions of new cruzeiros; also as a proportion of total assets).

	December 1970	December 1971	December 1972	December 1973	March 1974	June 1974	September 1974	December 1974	March 1975	June 1975	September 1975	December 1975	March 1976	June 1976	September 1976	December 1976
Required reserves	3645	4909	6562	10118	10773	10753	10783	10830	8771	10461	11831	13690	14192	18202	24208	29253
	0.13	0.12	0.11	0.12	0.12	0.11	0.10	0.09	0.08	0.08	0.06	0.08	0.08	0.09	0.11	0.11
Total reserves	5505	7664	11164	16967	15476	16208	15982	19319	15694	18802	18841	23995	22646	30484	35459	45663
	0.20	0.19	0.18	0.20	0.17	0.16	0.15	0.17	0.14	0.14	0.13	0.15	0.13	0.15	0.16	0.16
Total loans	16573	25099	36697	50984	54974	59014	64495	71877	73423	84085	93548	106055	115365	131694	141486	157324
	0.59	0.61	0.59	0.60	0.61	0.60	0.62	0.62	0.63	0.63	0.66	0.65	0.68	0.62	0.64	0.64
Securities holdings	576	1041	1655	2361	3454	4042	4221	4764	4644	6002	5633	8803	7578	11469	10916	15149
	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.06	0.05	0.05
Total assets	27978	41112	61679	85011	89849	98585	104301	116148	116192	134017	142597	162351	170684	202369	219438	254850
Liabilities																
Total deposits	18646	26296	38037	52283	53124	55672	57344	67857	65645	75882	81337	97918	94567	110682	113008	136530
	0.67	0.64	0.62	0.62	0.59	0.56	0.55	0.58	0.56	0.57	0.57	0.60	0.55	0.55	0.51	0.51
Debt to monetary authority	1511	2243	3020	3782	4561	6106	8234	6136	9032	11704	13769	12931	17918	19497	20138	18718
	0.05	0.05	0.05	0.04	0.05	0.06	0.08	0.05	0.08	0.09	0.10	0.08	0.10	0.10	0.09	0.09
Debt to government financial institutions	649	1084	1482	1750	1945	2096	2392	2927	3189	3384	3385	3957	4154	4735	5462	6269
	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Foreign exchange liabilities	2702	4823	9606	13902	17006	20186	20979	20596	19924	21526	21136	21962	27038	34422	41734	51546
	0.10	0.12	0.16	0.16	0.19	0.20	0.20	0.18	0.17	0.16	0.15	0.14	0.16	0.17	0.19	0.19
Liabilities for collection	875	1593	2656	3740	3351	3532	4724	6117	5395	6227	7342	8029	8605	10131	11404	12866
	0.03	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
(1) + (2)	0.66	0.62	0.59	0.60	0.70	0.66	0.67	0.56	0.56	0.55	0.63	0.57	0.63	0.60	0.68	0.68
(3) + (6)	0.89	0.95	0.96	0.98	1.03	1.06	1.12	1.16	1.12	1.11	1.15	1.08	1.22	1.14	1.25	1.1
(6) deflated by the general price index	18646	21958	27052	32680	30079	28409	28050	31514	28712	31260	31177	35194	30498	32407	29626	33524
percentage change (December/December)		+17.8	+23.2	+20.7	-7.9	-5.6	-1.3	+12.3	-8.9	+8.9	-0.3	+12.9	-13.3	-7.9	-8.6	+13.2
Index: Cleared checks + demand deposits (1966=100)	128	172	183	199	192	185	210	239	256	330	380	350	361	413	391	446

TABLE 10. Selected financial assets, 1972-1976. (Millions of new Cuzatiro, and percentage change over the preceding period).

	December 1972	December 1973	March 1974	June 1974	September 1974	December 1974	March 1975	June 1975	September 1975	December 1975	March 1976	June 1976	September 1976	December 1976
1. Monetary assets	63829	93835	97521	105032	107993	125185	121139	138419	149057	179337	174709	204105	207744	246345
(December/December)		+47.0	+3.9	+7.7	+2.8	+15.9	-3.2	+14.3	+8.3	+19.6	-2.6	+16.8	+1.8	+19.5
2. Index linked savings accounts in the SFI (December/December)	7713	14122	16030	18680	22421	28925	34303	40201	47807	55234	64721	76634	91677	107339
		+83.1	+13.5	+15.3	+21.3	+29.0	+18.6	+17.1	+18.9	+15.5	+17.1	+18.7	+19.3	+17.3
3. Time deposits* (December/December)	17017	25811	27725	28635	30978	33471	35858	42472	50191	54568	56727	66053	66656	73132
		+51.7	+7.4	+3.3	+8.2	+8.0	+7.1	+18.4	+18.1	+8.7	+4.0	+20.4	+3.9	+9.7
4. Index linked housing bonds (December/December)	5015	6517	6772	6945	7645	8287	8550	8212	8686	8937	9031	9448	9574	9729
		+30.0	+3.9	+2.6	+10.1	+8.4	+3.2	-4.0	+5.8	+2.9	+1.1	+4.6	+1.3	+2.1
5. Index linked state and municipal bonds (December/December)	1721	3232	3272	3752	4607	5417	5856	6875	8537	13834	14644	15661	16593	22730
		+87.8	+1.2	+14.7	+22.8	+17.6	+8.1	+17.4	+24.2	+62.0	+5.9	+6.9	+18.7	+24.9
6. Government bonds held by the public (December/December)	15893	20804	22300	25373	29863	32937	35119	42489	49727	57650	62677	66590	76197	80557
		+30.9	+7.2	+13.8	+17.6	+10.4	+6.6	+21.0	+17.0	+16.0	+8.6	+6.7	+13.9	+6.1
7. Government bills held by the public (December/December)	8054	12612	13598	13149	11486	14405	17439	21071	24619	22136	34034	49347	55335	64750
		+56.6	+7.8	-3.3	-12.6	+25.4	+21.0	+20.8	+16.8	-10.1	+53.7	+45.0	+12.1	+17.0
8. Exchange acceptances (December/December)	20973	34820	38442	38761	40275	42608	44034	46586	50508	55809	58530	61965	64680	68392
		+66.3	+10.4	+0.8	+3.9	+5.8	+3.3	+5.8	+8.5	+10.5	+4.9	+5.9	+4.4	+5.7
9. Total principal financial assets (excepting equities)	162448	216681	227871	246851	260081	291695	307377	352038	399881	465267	479334	561395	608260	684306
						+22.4	+30.7	+35.2	+39.9	+31.0	+47.9	+56.1	+60.8	+68.4
10. General price index (December/December)	343	397	438	486	507	534	567	602	647	690	765	847	946	1010
		+15.7	+10.3	+11.0	+4.3	+5.3	+6.2	+6.2	+7.5	+6.6	+11.4	+10.1	+11.7	+6.2

TABLE 13. 12 months' yield of selected securities: nominal return over the 12 months to the date given, 1973-1976. (Percent per annum)

	March 1973	June 1973	September 1973	December 1973	March 1974	June 1974	September 1974	December 1974	March 1975	June 1975	September 1975	December 1975	March 1976	June 1976	September 1976	December 1976
Interbank overnight	14.0	12.9	12.4	13.3	13.9	15.1	15.5	14.7	14.8	13.9	14.0	16.7	18.9	23.2	27.5	
Government bill: 91 days - secondary mkt.	20.0	19.2	18.2	17.6	17.0	17.2	17.7	19.4	20.7	22.1	22.4	22.6	25.5	31.0	38.1	45.6
Government bill: 365 days - primary mkt.					15.8	15.0	15.0	15.4	15.9	17.4	21.0	20.7	22.6	18.6	21.8	20.6
Index linked government bonds	18.9	18.3	16.9	17.1	19.9	21.5	28.4	39.5	39.4	39.8	30.2	28.9	30.9	33.0	37.2	
Postbook savings - Savings Banks	22.0	21.5	20.0	19.7	20.5	21.2	25.4	38.4	40.4	41.7	40.4	30.5	32.1	33.9	36.9	41.4
Dom. banks' time deposits:																
without CD	24.0	24.0	24.0	24.0	21.0	21.0	21.0	21.0	21.0	24.0	26.0	26.0	26.0	26.3	26.0	31.2
with CD	24.0	24.0	24.0	24.0	21.0	21.0	21.0	21.0	21.0	24.0	27.0	27.0	27.0	26.3	26.0	31.2
Investment banks' time dep.																
without CD	24.0	24.0	24.0	24.0	21.0	21.0	21.0	21.0	21.0	25.0	27.0	27.0	27.0	26.3	26.0	29.8
with CD	24.0	24.0	24.0	24.0	21.0	21.0	21.0	21.0	21.0	25.0	28.0	28.0	28.0	26.3	26.0	29.8
Investment banks' time dep.																
index linked, with CD	23.6	23.0	21.6	21.8	23.3	24.9	36.4	42.3	42.2	42.8	33.4	32.2	34.1	36.2	40.2	
index linked, without CD	23.6	23.0	21.6	21.8	23.3	24.9	36.4	42.3	42.2	42.8	33.4	32.2	34.1	36.2	40.2	
Exchange acceptances:																
Primary market	25.8	25.3	24.3	24.2	22.3	22.1	22.1	22.0	23.6	25.2	26.8	27.0	26.7	26.7	26.8	26.5
Secondary mkt., 30 days																
Secondary mkt., 360 days																
Bolsa de Janeiro stock exch. index	-48.9	-5.6	-3.5	-12.7	35.6	-23.8	-14.9	40.5	9.1	66.5	81.9	34.9	56.1	28.8	28.6	
Stock mutual funds:																
Regular - 10 largest	-29.5	-5.1	12.0	2.0	20.4	-10.8	-23.3	0	-18.6	45.4	56.4	38.0	69.8	37.5		
Decree Law 157 - 4 largest	-25.2	-12.9	-1.7	-6.5	5.8	-11.1	-18.8	0	-15.4	37.5	38.9	25.0	54.8	31.8		
General price index	14.7	15.2	14.0	15.7	22.3	31.0	32.7	34.5	29.5	23.9	27.6	29.2	35.6	40.7	46.2	46.4
Foreign exchange correction	8.0	7.4	6.5	4.7	2.0	6.3	9.8	12.0	17.9	18.8	13.4	14.3	16.1	24.3	30.7	

TABLE 1. The Brazilian monetary authorities' assets of the Banco Central do Brasil and the Banco do Brasil, 1971-1976, (in millions of cruzeiros, 1970 = 100)

	December 1971	December 1972	December 1973	December 1974	December 1975	December 1976	September 1976	October 1976
Assets								
1. Credit to commercial banks, (December/December)	5711	9015	10243	12644	17067	18169	24070	39136
	+50.3	+57.9	+13.6	+23.4	+34.9	+6.5	+21.5	+20.3
2. Credit to development banks, (December/December)	1155	2156	3505	4418	5301	6030	11001	21062
	+22.9	+20.0	+10.0	+22.9	+10.0	+10.0	+15.7	+8.9
3. Credit to other financial institutions, (December/December)	354	486.7	710	835	1033	1272	1607.3	9330
	+3.3	+7.0	+9.8	+16.1	+15.6	+17.3	+27.8	+11.4
4. Credit to the Banco do Brasil to private banks, (December/December)	22409	30277	4442	48967	56550	64346	66274	141365
	+14.3	+10.0	+7.8	+15.3	+15.8	+17.5	+9.5	+6.5
5. Foreign-exchange assets	1380	24133	777.1	12267	6739	51257	47621	51432
	+1.4	+20.6	+20.6	+20.6	+20.6	+20.6	+20.6	+20.6
Liabilities								
6. Liabilities on account of the National Treasury (December/December)	-45.9	1.4	1206	14150	147.0	17037	22676	30004
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
7. Resources of Banco Central Finance Programme (December/December)	16081	21132	267.3	39337	35222	36894	38435	41296
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
8. Resources of Banco do Brasil Finance Programme (December/December)	263	1453	476	7807	9617	11298	14025	20951
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
9. Foreign-exchange liabilities (December/December)	4409	5248	7583	8780	10673	12263	15180	16503
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
10. Deposits in the Banco do Brasil (December/December)	7735	9574	14631	18910	19993	20681	21304	22748
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
11. Monetary base (December/December)	23392	27774	40776	42504	46232	48288	50636	55039
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
12. Total assets of the monetary authorities	56466	86181	127662	138527	156062	194453	207770	236617
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
13. Money supply	44514	61550	90490	93857	100885	103574	120788	116573
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
14. Money multiplier (13) x (11)	1.9	2.2	2.2	2.2	2.2	2.2	2.2	2.2
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
15. (10) deflated by the general price index	6459	6922	9140	9654	9649	9780	9605	9318
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
16. (4) x (10)	2.9	3.2	3.1	2.9	3.0	3.2	3.9	4.1
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4
17. (13) deflated by the general price index (December/December)	44514	53295	67698	63643	61652	60674	67180	61062
	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4	+1.4

*Includes investment banks, finance companies, savings banks of the federal and state governments, and cooperatives.

Sources: *Boletim do Banco Central do Brasil*



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